Volunteer Lake Assessment Program Individual Lake Reports

BROAD BAY, OSSIPEE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	224,432	**Max. Depth (m):**	22.3	**Flushing Rate (yr^{-1})**	34.1
Surface Area (Ac.):	464	**Mean Depth (m):**	8.3	**P Retention Coef:**	0.04
Shore Length (m):	10,600	**Volume (m^3):**	15,573,500	**Elevation (ft):**	406

TROPHIC CLASSIFICATION

Year	Trophic class
1987	OLIGOTROPHIC
2003	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

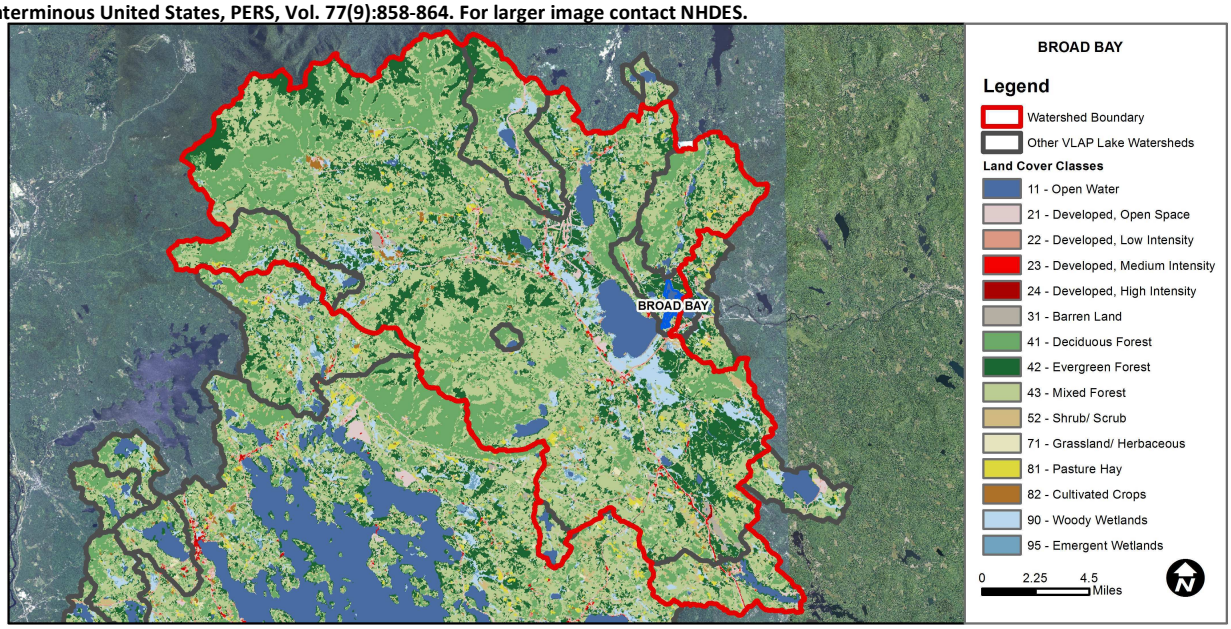
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Very Good	At least 10 samples with 0 exceedances of criteria.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	No Data	No Data for this parameter.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

BROAD BAY - CAMP ROBIN HOOD BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
BROAD BAY - CAMP HUCKINS BEACH	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
LEAVITT BAY - CAMP MARIST BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

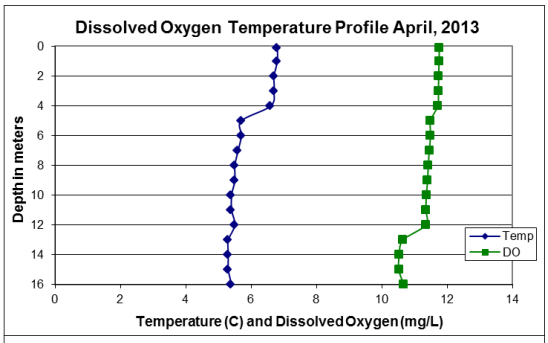


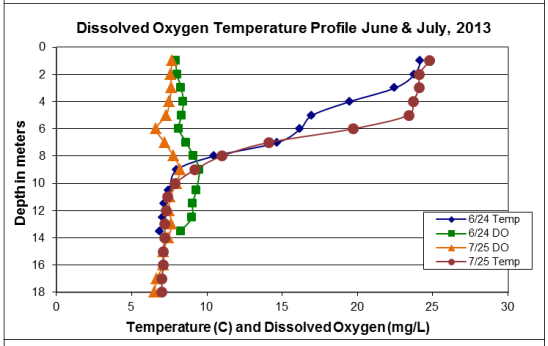
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.56	Barren Land	0.64	Grassland/Herbaceous	0.36
Developed-Open Space	2.91	Deciduous Forest	23.33	Pasture Hay	0.85
Developed-Low Intensity	0.74	Evergreen Forest	20.37	Cultivated Crops	0.5
Developed-Medium Intensity	0.24	Mixed Forest	38.49	Woody Wetlands	4.63
Developed-High Intensity	0.04	Shrub-Scrub	2.67	Emergent Wetlands	0.6

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
BROAD BAY, OSSIPEE, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were low through July and increased slightly in September. Average levels were well below the state median and slightly less than 2012 levels.
- **CONDUCTIVITY/CHLORIDE:** Deep spot conductivity and chloride levels were low and approximately equal to the state medians. Historical trend analysis indicates stable epilimnetic conductivity with low variability between years.
- **TOTAL PHOSPHORUS:** April phosphorus levels were elevated (range 15-20 ug/L) throughout the water column. Epilimnetic phosphorus decreased to low levels in May and June, spiked in July following over two inches of rainfall, and decreased again in September. Metalimnetic and Hypolimnetic phosphorus levels remained low and stable throughout the summer. Historical trend analysis indicates significantly increasing (worsening) epilimnetic phosphorus since monitoring began.
- **TRANSPARENCY:** Transparency was good in May and then decreased to below 3.0 meters through September. Viewscope transparency was much better than non-viewscope transparency in September and likely a better representation of actual transparency at the Broad Bay station. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **TURBIDITY:** Deep spot turbidity levels were low and relatively stable throughout the summer.
- **PH:** Metalimnetic and hypolimnetic pH decreased to undesirable range 6.5 – 8.0 units. Epilimnetic pH remained good and historical trend analysis indicates highly variable epilimnetic pH.
- **RECOMMENDED ACTIONS:** The worsening epilimnetic phosphorus trend is likely a result of stormwater runoff from the increased frequency and intensity of storm events. For exampe, epilimnetic phosphorus spiked to 15 ug/L in July following over two inches of rainfall. The worsening transparency trend may be a result of suspended sediments from stormwater runoff or from natural interferences such as wave action. Utilize a viewscope on each sampling to more accurately measure transparency. Implement stormwater improvement projects on lake front properties to capture and infiltrate stormwater before entering the lake or tributaries. DES' "NH Homeowner's Guide to Stormwater Management" is a useful resource. Keep up the great work!





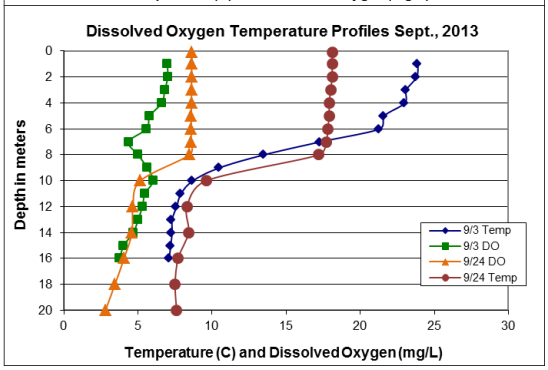
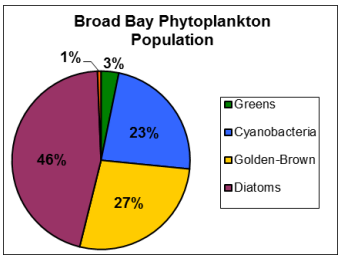


Table 1. 2013 Average Water Quality Data for BROAD BAY

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	5.40	2.56	4	38.1	8	2.91	4.50	0.45	6.72
Metalimnion				38.2	6			0.51	6.47
Hypolimnion				38.9	7			0.75	6.15

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)



HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
Conductivity	Stable	Trend not significant; data show low variability.	Transparency	Degrading	Data significantly decreasing.
			Phosphorus (epilimnion)	Degrading	Data significantly increasing.